

Applicant : Xiaoli Fu, et al.  
Serial No. : 10/826,658  
Filed : April 15, 2004  
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Attorney's Docket No.: 13854-067001

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A dispersion compensation module comprising:  
a single polarization collimator;  
a polarizer coupled to the single polarization collimator and having a first port, a second port, and a third port, the polarizer operable to receive a light beam at the first port, having a single polarization, from the single polarization collimator, such that the entire light beam is directed from the first port to the second port;  
a reflection etalon optically coupled to the second port of the polarizer; and  
a quarter-waveplate positioned between the reflection etalon and the second port of the polarizer.
2. (Original) The dispersion compensation module of claim 1, wherein the dispersion compensation module is operable to apply a group delay profile to at least one optical signal.
3. (Original) The dispersion compensation module of claim 1, wherein the polarizer is operable to redirect a first optical signal having a first polarization input at the first port to be output from the second port and to redirect a second optical signal having a second polarization perpendicular to the first polarization input at the second port to be output at the third port.
4. (Original) The dispersion compensation module of claim 3, wherein the reflection etalon is operable to apply a group delay profile to the first optical signal output from the second port.

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5. (Currently Amended) The dispersion compensation module of claim 1, wherein the quarter-waveplate polarizer is operable to rotate a polarization of ~~the~~ a first optical signal output from the second port by 45 degrees and allow the first optical signal to propagate toward the reflection etalon, the quarter waveplate for rotating a polarization of an optical signal reflected back from the reflection etalon by a further 45 degrees into a second optical signal having a second polarization perpendicular to the first polarization and allowing the second optical signal to be input at the second port of the polarizer.
6. (Original) The dispersion compensation module of claim 1, further comprising:  
one or more single polarization collimators coupled to the polarizer quarter wave plate etalon assembly.
7. (Original) The dispersion compensation module of claim 1, further comprising:  
a tuner coupled to the reflection etalon, operable to adjust a resonant frequency of the reflection etalon.
8. (Original) The dispersion compensation module of claim 7, further comprising:  
a controller coupled to the tuner and operable to control the tuner.
9. (Original) The dispersion compensation module of claim 7, wherein the tuner is a heater.
10. (Original) The dispersion compensation module of claim 7, wherein the tuner is one or more electrodes.

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11. (Currently Amended) A dispersion compensation module for applying a desired group delay profile to at least one an input optical signal signals, the dispersion compensation module comprising:

a plurality of etalon assemblies, each etalon assembly for applying a group delay profile to ~~an the one~~ optical signal, each etalon assembly arranged so that the ~~at least one~~ optical signal passes at least once therethrough, each ~~polarizer quarter-wave plate~~ etalon assembly comprising:

a polarizer having a first port, a second port, and a third port operable to, said polarizer for redirecting a first direct an optical signal, having a first polarization, input at the first port to be output from the second port and operable to, said polarizer for redirecting a second direct an optical signal, having a second polarization perpendicular to the first polarization, input at the second port to be output at the third port;

a reflection etalon arranged for application of a group delay profile to the ~~first~~ optical signal output from the second port; and

a quarter-wave plate located between the reflection etalon and the polarizer, for rotating a polarization of the ~~first~~ optical signal output from the second port by 45 degrees and allowing ~~said first the~~ optical signal to propagate toward the reflection etalon, ~~said the~~ quarter-wave plate ~~for operable to rotating rotate~~ a polarization of ~~an the~~ optical signal reflected back from the reflection etalon by a further 45 degrees ~~into a second such that the~~ optical signal ~~having has~~ a second polarization perpendicular to the first polarization and allowing ~~said second the~~ optical signal to be input at the second port of the polarizer, and

a single polarization collimator coupled to the first port of a first polarizer of the plurality of etalon assemblies and operable to provide a light signal to the first port of the polarizer having a single polarization.

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12. (Withdrawn) A dispersion tolerant receiver module comprising:
  - a dispersion compensation module comprising:
    - a polarizer having a first port, a second port, and a third port;
    - a reflection etalon; and
    - a quarter-wave plate located between the reflection etalon and the second port of the polarizer; and
    - a photodetector coupled to the dispersion compensation module.
13. (Withdrawn) The receiver module of claim 12, wherein the photodetector is a PIN-TIA.
14. (Withdrawn) The receiver module of claim 12, wherein the photodetector is an APD-TIA.
15. (Withdrawn) A wavelength tracking apparatus comprising:
  - a beam splitter for receiving an optical signal from a dispersion compensation module, and for outputting a reference optical signal and a monitoring optical signal;
  - a reference photodiode for receiving said reference optical signal;
  - a monitor etalon for transmitting the monitoring optical signal;
  - a monitor photodiode for receiving an optical signal transmitted by the monitor etalon;
  - and
  - a controller operable to adjust a frequency shift of a group delay profile of the dispersion compensation module using a ratio between a power of optical signals on the monitor photodiode and a power of optical signals on the reference photodiode.

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16. (Currently Amended) A dispersion compensation module comprising:

a single polarization collimator;

a first polarizer having a first port, a second port, and a third port, the single polarization collimator coupled to the single polarization collimator at the first port and operable to provide an optical signal to the first port, having a single polarization, such that the optical signal is directed to the second port of the polarizer; and

an etalon assembly pair optically coupled to the single polarization collimator, including comprising

a first etalon assembly including;

a the first polarizer having a first port, a second port, and a third port;

a first reflection etalon; and

a first quarter-waveplate positioned between the reflection etalon and the second port of the polarizer; and

a second etalon assembly including:

a second polarizer having a first port, a second port, and a third port;

a second reflection etalon; and

a second quarter-waveplate positioned between the reflection etalon and the second port of the second polarizer;

wherein, the third port of the first polarizer is coupled to the third port of the second polarizer.

17. (Currently Amended) The dispersion compensation module of claim 16, wherein the first polarizer is operable to ~~redirect a first~~ direct the optical signal, having an initial a first polarization, input at the first port to be output from the second port and to ~~redirect a second~~ direct the optical signal, having a second polarization perpendicular to the initial polarization, input at the second port to be output at the third port.

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18. (Currently Amended) The dispersion compensation module of claim 16, wherein the second polarizer is operable to ~~redirect~~ direct a first the optical signal, having ~~an initial~~ a first polarization, input at the third port to be output from the second port and to ~~redirect a second~~ direct the optical signal, having a second polarization perpendicular to the ~~initial~~ first polarization, input at the second port to be output at the first port.
19. (Original) The dispersion compensation module of claim 16, wherein the dispersion compensation module is operable to apply a group delay profile to at least one optical signal.
20. (Cancelled)
21. (Currently Amended) The dispersion compensation module of claim 16, wherein each polarizer is operable to rotate an initial polarization of an optical signal output from a second port by 45 degrees and allow the optical signal to propagate toward each reflection etalon, the ~~quarter waveplate~~ quarter-waveplate for rotating a polarization of an optical signal reflected back from the reflection etalon by a further 45 degrees into an optical signal having a polarization perpendicular to the initial polarization and allowing the optical signal to be input at a ~~same~~ second port of each polarizer.
22. (Original) The dispersion compensation module of claim 16, further comprising:  
a single polarization collimator coupled to port one of each polarizer.
23. (Original) The dispersion compensation module of claim 16, further comprising:  
a reflector coupled to the second etalon assembly.
24. (Original) The dispersion compensation module of claim 16, further comprising:  
a tuner coupled to each reflection etalon and operable to adjust a resonant frequency of each reflection etalon.
25. (Original) The dispersion compensation module of claim 24, further comprising:  
a controller coupled to each tuner and operable to control each tuner.

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26. (Original) The dispersion compensation module of claim 24, wherein the tuner is a heater.

27. (Original) The dispersion compensation module of claim 24, wherein the tuner is one or more electrodes.

28. (Currently Amended) The dispersion compensation module of claim 16, further comprising:

a plurality of etalon assembly pairs, wherein a first port of a each etalon assembly pair is coupled to a first port of a another etalon assembly pair such that an optical signal can be directed to input at a first port of a first etalon assembly pair of the plurality of etalon assembly pairs and output at a first port of a last etalon assembly pair of the plurality of etalon assembly pairs.

29. (New) A method for dispersion compensation, comprising:

receiving an input optical signal having a single first polarization at a first port of a polarizer;

directing the optical signal to a second port;

rotating the polarization of the optical signal;

applying a group delay to the optical signal;

reflecting the optical signal;

rotating the polarization of the optical signal by an additional amount such that the optical signal has a second polarization orthogonal to the first polarization;

receiving the optical signal at the second port; and

directing the optical signal to a third port.